Electronic Version
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Claims

[c1] 1. A method of identifying timing paths in a digital network with timing delays dominated by a particular factor, said method comprising:

partitioning timing delays in said digital network into portions attributable to a factor of interest and portions attributable to other factors;

multiplying said timing delays by different weights based on said partitioning; and

using the multiplied timing delays to determine a relative timing delay impact of said factor of interest on the various paths in said digital network.

[c2] 2. The method of claim 1, further comprising identifying digital network paths whose timing delays are dominated by a particular factor of interest.

[c3] 3. The method of claim 1, further comprising setting arrival times of timing signals at digital network path start points to zero.

[c4] 4. The method of claim 1, wherein said different weights comprise any of a positive weight, a negative weight, and a zero weight.

[c5] 5. The method of claim 4, further comprising:

inputting a threshold fraction value;

setting said different weights on said portion of timing delays attributable to said factor of interest to a first value;

setting said different weights on said portion of timing delays attributable to said other factors.

[c6] 6. The method of claim 5, further comprising:

performing a node-based static timing analysis on said digital network using said multiplied timing delays; and

identifying path endpoints of said digital network to which at least one path has a timing delay fraction attributable to said factor of interest which is greater than or equal to said first value.

[c7] 7. The method of claim 6, wherein said first multiplicative weight of said first value is positive, wherein said node-base static timing analysis comprises a late mode analysis, and said endpoint identification comprises identifying path endpoints whose signal arrival time computed by said node-base static timing analysis is greater than zero.

[c8] 8. The method of claim 6, wherein said first multiplica-

tive weight of said first value is negative, wherein said node-base static timing analysis comprises an early mode analysis, and

said endpoint identification comprises identifying path endpoints whose signal arrival time computed by said node-base static timing analysis is less than zero.

[c9] 9. The method of claim 5, further comprising determining a path in said digital network for which a ratio between a sum of said portion of timing delay attributable to said factor of interest and a sum of said portion of timing delay attributable to said other factors is maximum.

[c10] 10. The method of claim 9, further comprising:

adjusting said threshold fraction value;

repeating said setting of said different weights using said adjusted threshold fraction value; and

repeating said node-based static timing analysis step.

[c11] 11. The method of claim 1, further comprising:

using arrival times of timing signals at digital network path endpoints to determine an amount of total timing delay of any digital network path to an endpoint attributable to said factor of interest; and

using timing margins at a timing test to determine whether said total timing delay due to said factor of interest on any path to a first side of any timing test is greater than a multiplicative factor of said total timing delay due to said factor of interest along any path to a second side of said timing test.

[c12] 12. The method of claim 11, wherein said timing test comprises a difference between an earliest arriving timing signal along a first path in said digital network and a latest arriving timing signal along a second path in said digital network.

[c13] 13. The method of claim 11, wherein any digital network path endpoint comprising a positive timing signal arrival time indicates at least one digital network path comprising a total timing delay due to said factor of interest exceeding a specified fraction of said total timing delay.

[c14] 14. The method of claim 11, wherein any timing test comprising a negative timing margin indicates a portion of a late mode network path timing delay due to said factor of interest is greater than a multiplicative amount of a portion of an early mode network path timing delay due to said factor of interest.

[c15] 15. A method of performing node-based static timing

analysis on a digital network, said method comprising:

categorizing factors influencing signal timing delays in said digital network as being attributable to either a factor of interest or to other factors;

attributing different weights to the timing delays based on said categorization to produce weighted timing delays; and

identifying network paths in said digital network comprising timing delays dominated by a particular factor of interest based on said weighted timing delays.

[c16] 16. The method of claim 15, wherein said step of attributing comprises multiplying said timing delays by said different weights, wherein said different weights comprise any of a positive weight, a negative weight, and a zero weight.

[c17] 17. The method of claim 15, further comprising:

using arrival times of timing signals at digital network path endpoints to determine an amount of total timing delay of any digital network path to an endpoint attributable to said factor of interest; and

using timing margins at a timing test to determine whether said total timing delay due to said factor of interest on any path to a first side of any timing test is greater than a multiplicative factor of said total

timing delay due to said factor of interest along any path to a second side of said timing test.

[c18] 18. The method of claim 17, wherein said timing test comprises a difference between an earliest arriving timing signal along a first path in said digital network and a latest arriving timing signal along a second path in said digital network.

[c19] 19. The method of claim 17, wherein any digital network path endpoint comprising a positive timing signal arrival time indicates at least one digital network path comprising a total timing delay due to said factor of interest exceeding a specified fraction of said total timing delay.

[c20] 20. The method of claim 17, wherein any timing test comprising a negative timing margin indicates a portion of a late mode network path timing delay due to said factor of interest is greater than a multiplicative amount of a portion of an early mode network path timing delay due to said factor of interest.

[c21] 21. A program storage device readable by computer, tangibly embodying a program of instructions executable by said computer to perform a method of performing node-based static timing analysis on a digital network, said method comprising:

categorizing factors influencing signal timing delays in said digital network as being attributable to either a factor of interest or to other factors;

attributing different weights to the timing delays based on said categorization to produce weighted timing delays; and

identifying network paths in said digital network comprising timing delays dominated by a particular factor of interest based on said weighted timing delays.